INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

Media and Communications Services **FACT SHEET**

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Acid Rain

What is acid rain?

- Acid rain, also known as acid deposition, is a broad term used to describe several ways that acids fall from the atmosphere and adversely impact the environment.
- Sulfur dioxide (SO_2) and nitrogen oxides (NOx) emissions are the pollutants that contribute to the formation of acid rain. Power plants are major sources of both SO_2 and NOx, while industry and automobiles have been shown to be major emitters of NOx.
- The U.S. EPA estimates that about two-thirds of all SO_2 and one-third of all NOx emissions come from electric power generation that relies on burning fossil fuels like coal.

How does acid rain occur?

- Acid rain occurs when gases react in the atmosphere with water, oxygen and other chemicals to form various acidic compounds. Sunlight increases the rate of most of these reactions.
- Acid rain comes in two forms: wet and dry deposition.
- Wet deposition refers to acidic rain, fog and snow. As this acidic water flows over and through the ground, it affects soils, waterways and a variety of plants and animals.
- Dry deposition refers to the acidic gases and particles in the atmosphere that fall back to earth. According to the U.S. EPA, about half the acidity in the atmosphere falls in the form of dry deposition. The wind blows these acidic particles and gases onto buildings, cars, homes and trees.

Why is acid rain a concern?

- Acid rain causes a variety of effects that harm or kill individual fish, reduce fish population numbers, completely eliminate fish species from a waterbody and decrease bio-diversity.
- Acid rain has been shown to slow plant growth and cause harm to forests.
- Acid rain weakens trees by damaging their leaves, limiting the nutrients available to them, or exposing them to toxic substances slowly released from the soil.
- Automotive coatings may be damaged by acid rain, especially when dry acidic deposition is mixed with dew or rain.
- Acid rain contributes to the corrosion of metals, such as bronze, and the deterioration of paint and stone, such as marble and limestone. These effects damage buildings, bridges and cultural objects, such as statues, monuments, and tombstones.

What is being done to reduce acid rain?

- In 1978 the U.S. EPA instituted the Acid Deposition Control Program, which requires reductions of SO_2 and NOx emissions by 2010. Under this program, the U.S. EPA established criteria for power plants to reduce emissions by 10 million tons from 1980 levels. NOx emissions are to be reduced by two million tons each year compared to levels before 1990.
- According to the U.S. EPA, Indiana has reduced SO_2 emissions from utilities by 50 percent from 1990 levels.
- Power plants are required to follow permit guidelines set by local, state and federal environmental agencies to reduce SO2 and NOx emissions. Examples of techniques these facilities are using include the installation of scrubbers and selective catalytic reduction systems and switching to coal that has a lower sulfur content.
- Automobiles, which are a major source of NOx, are required to have catalytic convertors to reduce emissions.
- Recent studies have shown a measurable decrease of acidity levels in rainfall throughout northeastern states, indicating a strong correlation between SO_2 emission decreases from utilities and an improvement in rainfall acidity.

What can I do to help reduce acid rain?

- The following steps help reduce demand on power plants and in return, reduce the amount of pollution that can contribute to acid deposition:

- Turn off lights, computers and other appliances when you're not using them.
- Use energy efficient appliances: lighting, air conditioners, heaters, refrigerators, washing machines, etc.
- Only use electric appliances when you need them.
- Keep your thermostat at 68 degrees F in the winter and 72 degrees F in the summer.
- Insulate your home as best as you can.
- Carpool, use public transportation, walk or ride your bicycle whenever possible.
- Maintain automobiles and ensure they are operating properly.

Where can I get more information?

- For additional information, contact the Indiana Department of Environmental Management, Office of Air Quality at (800) 451-6027 ext. 3-0178.